

# Claims

- [c1] A piston ring assembly, comprising:  
an upper ring;  
a lower ring; and  
an expander positioned between said upper ring and said lower ring, said expander including apexes adapted to contact said upper and lower rings;  
wherein radial compression of said upper and lower rings induces axial expansion of said expander.
- [c2] A piston ring assembly according to Claim 1, wherein the piston ring assembly is positioned within a ring groove of a piston such that said axial expansion of said expander urges said upper ring against an upper surface of said ring groove and said lower ring against a lower surface of said ring groove.
- [c3] A piston ring assembly according to Claim 1, wherein said upper ring includes a first shoulder recess about an inner periphery thereof and said lower ring includes a second shoulder recess about an inner periphery thereof, said first and second shoulder recesses defining a cavity to receive said expander.

- [c4] A piston ring assembly according to Claim 1, wherein said expander is generally sinusoidal in shape and includes two ends defining an expander gap such that radial compression of said upper and lower rings mates said two ends thereby closing said expander gap and said mated two ends form a generally W-shaped configuration.
- [c5] A piston ring assembly according to Claim 1, wherein said apexes of said expander are generally flat and are supported by two adjacent leg members such that an angle defined by said adjacent leg members is about 16 degrees.
- [c6] A piston ring assembly according to Claim 1, wherein said upper ring includes a first ring gap and said lower ring includes a second ring gap.
- [c7] A piston ring assembly according to Claim 1, wherein said upper and lower rings each include a lip extending about an outer periphery thereof.
- [c8] A piston ring assembly according to Claim 1, wherein one of said upper ring and said lower ring include a plurality of projections on a mating inner surface to define a plurality of vents.
- [c9] A piston ring assembly for retention in a ring groove of a

piston of an internal combustion engine, comprising:  
an upper ring for bearing against an upper surface of the piston ring groove, said upper ring defining a first shoulder recess about an inner periphery thereof;  
a lower ring for bearing against a lower surface of the piston ring groove, said lower ring defining a second shoulder recess about an inner periphery thereof, said first and second recesses defining a cavity; and  
a generally sinusoidal expander received in said cavity, said generally sinusoidal expander having alternating apexes, said apexes adapted to contact said upper and lower rings, wherein radial compression of said upper and lower rings induces axial expansion of said generally sinusoidal expander for urging said upper and lower rings against the upper and lower surfaces of the piston ring groove.

[c10] A piston ring assembly according to Claim 10, wherein said generally sinusoidal expander includes two ends defining an expander gap such that radial compression of said upper and lower rings mates said two ends, thereby closing said expander gap and said mated two ends form a generally W-shaped configuration.

[c11] A piston ring assembly according to Claim 10, wherein said apexes of said expander are generally flat and are supported by two adjacent leg members such that an

angle defined by said adjacent leg members is about 16 degrees.

- [c12] A piston ring assembly according to Claim 10, wherein said upper and lower rings each include a lip extending about an outer periphery thereof.
- [c13] A piston ring assembly according to Claim 10, wherein said upper ring includes a first ring gap and said lower ring includes a second ring gap.
- [c14] A piston ring assembly according to Claim 10, wherein one of said upper and lower rings include a plurality of projections on a mating inner surface to define a plurality of vents.